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10/088,758	07/18/2002	James Christopher O'Gorman	Q69113	8824
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SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			CONNELLY CUSHWA, MICHELLE R	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/088,758

Applicant(s)


O'GORMAN ET AL.

Examiner

Michelle R. Connelly-Cushwa

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 73-94 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 73-77, 79-94 is/are rejected.
- 7) ☒ Claim(s) 78 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0302</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

The prior art documents submitted by applicant in the Information Disclosure Statement filed on March 22, 2002 have all been considered and made of record (note the attached copy of form PTO-1449).

### ***Drawings***

Seven (7) sheets of formal drawings were filed on July 18, 2002.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the optical fiber defined in claim 84, the optical fiber core defined in claim 85, the cladding medium defined in claim 85, and the refractive index altering elements located in and extending around the cladding medium defined in claim 85 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

**Claims 76 and 93 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a**

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**previous claim.** Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Regarding claims 76 and 93; the claims do not further limit the subject matter of claim 75 or claim 91, respectively, from which they depend, because the respective lengths and effective refractive indices of the respective reflecting locations must *inherently* be the same or different, since there are no other known possibilities.

**Claim 90 is objected to because of the following informalities:** in line 3 of claim 90, "20 guiding" should be changed to --guiding--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 75-77, 79, 80, 82-88, 92 and 94 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Regarding claim 75; the claim recites the limitation "and preferably, ..." in line 3 of the claim and the limitation "and advantageously, ..." in line 4 of the claim. It is unclear from the terms "preferably" and "advantageously" whether or not the invention is required to have the limitations following these terms.

Regarding claim 77; the claim recites the limitation "and preferably, ..." in line 7 of the claim, the limitation "and advantageously, ..." in lines 11-12 of the claim, and the limitation "and ideally, ..." in line 15 of the claim. It is unclear from the terms "preferably",

“advantageously”, and “ideally” whether or not the invention is required to have the limitations following these terms.

Regarding claim 79; the claim recites the limitation “and preferably, ...” in lines 5-6 of the claim. It is unclear from the term “preferably” whether or not the invention is required to have the limitations following this term.

Regarding claim 80; the claim recites the limitation “and preferably, ...” in line 4 of the claim. It is unclear from the term “preferably” whether or not the invention is required to have the limitations following this term.

Regarding claim 82; the claim recites the limitation “may be a semiconductor laser light generating device” in lines 2-3 of the claim and the limitation “may be a passive semiconductor waveguide” in line 3 of the claim. These limitations are indefinite because it is unclear whether or not the optical waveguide is a semiconductor laser light generating device or a passive semiconductor waveguide. For the purpose of examination with respect to prior art, the Examiner has interpreted the claim language to mean that the waveguide is not required to be either a semiconductor light generating device or a passive semiconductor waveguide, and, therefore, has not addressed these limitations.

Regarding claim 83; the claim recites the limitation “and preferably, ...” in line 3 of the claim and the limitation “and advantageously, ...” in lines 4-5 of the claim. It is unclear from the terms “preferably” and “advantageously” whether or not the invention is required to have the limitations following these terms.

Regarding claim 84; the claim recites the limitation "may comprise a fibre optic waveguide" in line 2 of the claim. This limitation is indefinite because it is unclear whether or not the invention comprises a fibre optical waveguide. For the purpose of examination with respect to prior art, the Examiner has interpreted the claim language to mean that the invention is not required to comprise a fibre optic waveguide, and therefore, has not addressed this limitation.

Regarding claim 85; the claim recites the limitation "and preferably, ..." in line 4 of the claim. It is unclear from the term "preferably" whether or not the invention is required to have the limitations following this term.

Regarding claim 86; the claim recites the limitation "and preferably, ..." in line 3 of the claim. It is unclear from the term "preferably" whether or not the invention is required to have the limitations following this term.

Regarding claim 88; the claim recites the limitation "and preferably, ..." in line 2 of the claim. It is unclear from the term "preferably" whether or not the invention is required to have the limitations following this term.

Regarding claim 92; the claim recites the limitation "and preferably, ..." in line 3 of the claim. It is unclear from the term "preferably" whether or not the invention is required to have the limitations following this term.

Regarding claims 76, 80, 83, 84, 87 and 94; the claims inherently contain the deficiencies of any base or intervening claim from which they depend.

Appropriate correction is required.

***Specification***

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Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 73, 74, 79, 80, 82, 84 and 88-91 are rejected under 35 U.S.C. 102(e) as being anticipated by Bendett et al. (US 6,636,678 B1).**

Regarding claims 73 and 90; Figures 17A and 17B of Bendett et al. disclose an optical waveguide (waveguide) for outputting light of a substantially single predetermined wavelength, the optical waveguide comprising a light conducting medium defining a longitudinally extending optical path (waveguide) for guiding the light, the optical path (waveguide) extending longitudinally between respective spaced apart first and second ends, and a means (G) for causing partial longitudinal reflections of the light along the optical path (waveguide) at at least two spaced apart partial reflecting locations along the optical path for deriving light of the predetermined wavelength, characterized in that means (G) for causing the partial reflections locates the reflection locations along the optical path at distances from the first end along the optical path

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which are functions of the effective length of the optical path taking account of the alteration to the actual length of the optical path resulting from the affect of the means for causing the partial reflections on the actual length of the optical path (see column 29, line 48, through column 30, line 15).

Regarding claims 74 and 91; the means (G) for causing the partial reflections of the light at the at least two reflecting locations comprises a refractive index altering means (G) for altering the effective refractive index of the light conducting medium (waveguide) presented to light passing along the optical path at each of the at least two reflecting locations for causing the partial reflections (see column 29, lines 60-67).

Regarding claim 79; the refractive index altering means (G) comprises a plurality of refractive index altering elements, one refractive index altering element being provided for each reflecting location, the respective refractive index altering elements being located distances from the first end along the optical path similar to the distances from the first end of the corresponding reflecting location, and each refractive index altering element (G) being located spaced apart from an active region (waveguide) within which the optical path is defined.

Regarding claim 80; Bendett et al. discloses that each refractive index altering element (grating, G) may be provided by a refractive index altering groove (surface relief grating) formed in a medium (silicon oxide layer) adjacent the light conducting medium (waveguide) but spaced apart therefrom (see claim 1 of Bendett et al.), that the depth of the refractive index altering grooves may be the same or different and that the



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refractive index altering element extends substantially transversely relative to the optical path (see Figures 17A and 17B).

Regarding claim 82; the optical waveguide is a waveguide for laser light.

Regarding claim 84; in column 7, lines 8-10, Bendett et al. discloses that the optical waveguides may be buried heterostructure laser waveguides to avoid the effects of corrosive processes that result in surface etching.

Regarding claims 88 and 89; Bendett et al. teaches that a plurality of optical waveguides may be provided in the form of an array (see Figure 1A and Figures 29A and 29B and the corresponding detailed descriptions), and that the wavelength of light outputted from the respective waveguides of the array may be the same or different.

**Claims 73, 74 and 85 are rejected under 35 U.S.C. 102(e) as being anticipated by Kashyap (US 6,104,852).**

Regarding claim 73; Figures 15a-15d disclose an optical waveguide for outputting light of a substantially single predetermined wavelength, the optical waveguide comprising a light conducting medium (2, 3a) defining a longitudinally extending optical path for guiding the light, the optical path extending longitudinally between respective spaced apart first and second ends, and a means (33, 34) for causing partial longitudinal reflections of the light along the optical path at at least two spaced apart partial reflection locations along the optical path for deriving light of the predetermined wavelength, characterized in that the means for causing the partial reflections locates the reflecting locations along the optical path at distances from the first end along the optical path which are functions of the effective optical length of the

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optical path taking account of alternation to the actual length of the optical path resulting from the affect of the means for causing the partial reflections on the actual length of the optical path.

Regarding claim 74; the means (33, 34) for causing partial reflections of the light at the at least two reflection locations comprises a refractive index altering means for altering the effective refractive index of the light conducting medium presented to light passing along the optical path at each of the at least two reflecting locations for causing the partial reflections (see column 10, line 59, through column 11, line 34).

Regarding claim 85; the waveguide is a filter comprising an optical fiber core (2) which forms the light conducting medium for defining the optical path, the optical fiber core (2) being surrounded by a cladding medium (3a) of refractive index different to that of the optical fiber core, and each refractive index altering element (33, 34) is located in and extends around the cladding medium.

**Claims 73, 82 and 83 are rejected under 35 U.S.C. 102(b) as being anticipated by Carlson et al. (US 4,976,539).**

Regarding claim 73; Figures 1 and 2 of Carlson et al. disclose an optical waveguide for outputting light of a substantially predetermined wavelength at a particular location, the optical waveguide comprising a light conducting medium (20, 22, 24, 26, 28) defining a longitudinally extending optical path (ridge-type waveguide, see Figure 1) for guiding the light, the optical path extending longitudinally between respective spaced apart first and second ends and a means (18) for causing partial longitudinal reflections of the light along the optical path at at least two spaced apart

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partial reflecting locations along the optical path for deriving light of the predetermined wavelength, characterized in that the means for causing the partial reflections locates the reflecting locations along the optical path at distances from the first end along the optical path which are functions of the effective optical length of the optical path taking account of alteration to the actual length of the optical path resulting from the affect of the means for causing the partial reflections on the actual length of the optical path.

Regarding claim 82; the optical waveguide is for laser light.

Regarding claim 83; a ridge is formed on the surface of the semiconductor laser waveguide for defining the optical path through the light conducting medium and the refractive index altering elements (18) are located in the ridge at locations corresponding to the reflecting location and the refractive index altering elements are located in the ridge at locations directly corresponding to the partial reflecting location.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 75, 76, 81, 92 and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bendett et al. (US 6,636,678 B1).**

Regarding claims 75 and 92; the length of each reflecting location (G) in the longitudinal direction of the optical path (waveguide) is relatively short. Bendett et al., however, does not specifically state that the length of each reflection location in the

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longitudinal direction of the optical path is in the range of 0.3 microns to 200 microns or within the range of 1 micron to 4 microns. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the length of each reflection location in the longitudinal direction of the optical path be in the range of 0.3 microns to 200 microns or within the range of 1 micron to 4 microns, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233), and since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPA 215 (CCPA 1980)).

Regarding claims 76 and 93; the respective lengths of the reflecting locations (G) along the optical path and the effective refractive indices of the respective reflecting locations (G) may be the same or different in the invention of Bendett et al.

Regarding claim 81; the distance from the first end along the optical path to each reflecting location is measured to the center of the reflecting location. Bendett et al. does not disclose that the reflecting locations are formed by a dopant. Gratings, however, are commonly formed by doping regions of a layer or substrate with a dopant to vary the refractive index in that region and create grating fingers, thereby forming gratings. One of ordinary skill in the art would have found it obvious to form the gratings by forming grating fringes with a dopant in the layer disclosed by Bendett et al., since this is a known alternative method for manufacturing gratings in the art and it appears

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that the invention would perform equally well regardless of the specific method used to form the gratings.

***Allowable Subject Matter***

Claim 78 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 77, 86, 87 and 94 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claims 77, 78, 86, 87 and 94 distinguishes over the prior art of record for the following reasons.

Regarding claim 77; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical waveguide as defined in claim 77, characterized in that the distance of each reflecting location from the first end along the optical path is a function of the product of half the length of that reflecting location and the difference between its effective refractive index and the actual refractive index of the light conducting medium defining the optical path in combination with the other limitations of claim 77.

Regarding claim 78; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an

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optical waveguide as defined in claim 78, characterized in that the distance of the  $p^{\text{th}}$  reflecting location from the first end along the optical path is provided by the formula defined in claim 78.

Regarding claim 86 and 87; the claims are allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical waveguide as defined in claim 86, characterized in that the reflecting locations are provided at respective distances from the first end which correspond to the following fractions of the actual length of the optical path, namely,  $1/14$ ,  $1/7$ ,  $3/14$ ,  $2/7$ ,  $3/7$ ,  $4/7$  and  $5/7$  along the optical path in combination with the other limitations of claim 86. Claim 87 depends from claim 86.

Regarding claim 94; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious a method as defined in claim 94, characterized in that the distance of the  $p^{\text{th}}$  reflecting location from the first end along the optical path is provided by the formula defined in claim 94.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claims 77, 78, 86, 87 and 94.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Komatsu et al. (US 5,358,896) discloses a method of producing an optical integrated circuit with an array of semiconductor lasers having modulation

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units (1, 2; see Figure 1); and Koch et al. (US 6,490,044 B1) discloses a modulated array source in Figure 1.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

  
Michelle R. Connelly-Cushwa  
Patent Examiner

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